

Remarks/Arguments

The examiner is thanked for thoroughly reviewing the subject patent application. Applicants wish to point out the major features of their claimed invention, which is an inductive type magnetic writer having low DC resistance by virtue of a double layer coil structure in which the lower coil layer has a larger cross-sectional area (increased height) than the upper coil. In spite of the double coil and increased cross-sectional area of the lower coil portion, both coils fit within the narrow space formed by the vertical separation of the upper and lower pole pieces and lie beneath the write gap layer formed by the contact between the upper and lower pole pieces. The ability to fit both coils within a narrow vertical space between both pole pieces is a result of a chemical-mechanical planarization of the upper surface of the lower coil and the subsequent formation of the upper coil upon a thin alumina patch layer formed directly on that planarized surface. The lower coil is first covered with a blanket layer of photoresist which fills the spaces between the coils. The blanketed coil layer is then planarized to the level at which the upper surfaces of the coils are exposed and the thin alumina patch layer is then formed on top of the planarized coil surface. In short, the magnetic writer achieves a minimal overall height, the double coils are located between the poles below the write gap layer and the lower coil can be formed with a larger cross-sectional area than the upper coil.

Having thus briefly explained the present claimed invention, Applicants would like to address the specific objections raised by the Patent Examiner.

Claim Rejections- 35 USC 102

Applicants respectfully request reconsideration of the rejections of claim 1 and amended claim 5 as being anticipated by Hsu et al. (US 6,693,769).

Hsu discloses an inductive-type dual coil writer that differs significantly in its configuration from the present claimed invention. The upper and lower coils formed by Hsu are separated by..."a thick insulation layer, which is preferably alumina,..provided between the bottom and top write coils so as to provide an effective heat sink for the top coil." (column 4 lines 1-4). Hsu repeatedly refers to this thick layer which is needed as a heat sink and it is clearly illustrated as layer 226 in Hsu's Fig. 10A. Hsu states further: "It is important to note that the thick insulation layer 226 interfaces the first and second side surfaces...." (column 8, lines 43-44). Finally, Hsu provides a complete discussion section (column 9, lines 20-40) noting the importance of the "thick insulation layer." Moreover, this thick layer is deposited over the write gap layer (layer 207 in Fig. 12E), so that the lower coil layer of Hsu is below the write gap while the upper layer is above the write gap. Thus, Hsu's two coils are vertically separated by both a write gap layer and a thick layer of insulation.

In contrast, the patch layer, which is the only layer separating the two coil layers in the present claimed invention, is described in both the Specification and the claims as being "of minimal thickness" (bottom of page 4 and top of page 5 and line 15 of Claim

1). Further, in the present claimed invention, both coil layers are formed beneath the write gap layer. Placing the write gap layer above the coils eliminates a layer that separates them, thus insuring the absolute minimum separation between the coils. It is to be remembered that the present claimed invention achieves increased current-carrying capacity with low heat losses by forming the lower coil with the maximum possible cross-sectional area while retaining a minimum overall height of the writer. Hsu, on the other hand, interposes a heat dissipating layer of insulation between the two coil layers to achieve a similar result. It is in the best interests of Hsu to form a thick layer of insulation between layers, whereas the present claimed invention desires the minimum possible inter-layer separation.

Claim Rejections- 35 USC 103

Applicants respectfully request a reconsideration of the rejection of claims 2-4, 6 and 7 as being unpatentable over Hsu et al. (cited above) in view of Kamijima et al. (US 6,525,901).

Applicants would respectfully argue that there would be no suggestion in either Hsu or Kamijima to combine their respective teachings. Kamijima discloses a double coil structure in which the lower layer is covered entirely by photoresist. In column 6, lines 35-37, Kamijima states the “The insulating films 251 to 253 are preferably formed through the hardening of a photoresist material.” It is those films that are shown in Fig. 2 and Fig. 8 to be the insulation that blankets the coils. Kamijima’s reference to alumina refers to the write gap layer (column 6, line 26) and the protective overcoat (column 6

line 41). Therefore, in Kamijima, the upper layer is formed directly on the photoresist layer 252, not on an alumina patch layer. There is no alumina patch layer anywhere in Kamijima nor is there any indication of an attempt to minimize the separation between the upper and lower coils. Moreover, in Kamijima, it is the upper layer configuration that is unusual in that it has a variable height and width to accommodate the curved upper pole piece, the lower layer is conventional and is not formed with an increased height relative to the upper layer.

Based on these arguments, Applicants respectfully reiterate their assertion that Hsu and Kamijima, taken together, do not suggest the present claimed invention and that claims 2-4 and 6-7 are patentable over that combination of patents.

Conclusion

The Examiner is thanked for thoroughly reviewing the application. All claims discussed above are now believed to be allowable. If the Examiner has any questions regarding the above application, please call the undersigned attorney at 845-452-5863

Respectfully submitted,



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